

AMENDMENT UNDER 37 C.F.R. § 1.111

Application 10/762,532

Atty Docket No.: Q79448

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claim 1. (currently amended): A process for producing a lower aliphatic carboxylic acid ester, comprising reacting a lower alcohol and a lower aliphatic carboxylic acid in a gas phase in the presence of water and a catalyst, wherein said catalyst comprises an inorganic support having supported thereon at least one heteropolyacid and/or heteropolyacid salt.

Claim 2. (original): A process as claimed in claim 1, wherein the inorganic support is at least one member selected from the group consisting of silica, alumina, silica alumina and zeolite.

Claim 3. (original): A process as claimed in claim 2, wherein silica is silica gel comprising at least SiO₂ in an amount of 90% by mass or more.

Claim 4. (original): A process as claimed in claim 1, wherein the sum total of the heteropolyacid and/or a salt thereof supported is from 50 to 1,000 g based on 1 liter of the inorganic support before the loading of heteropolyacid and/or heteropolyacid salt.

Claim 5. (original): A process as claimed in claim 1, wherein the heteropolyacid is selected from the group consisting of the following heteropolyacids:

tungstosilicic acid
tungstophosphoric acid
molybdophosphoric acid
molybdosilicic acid

$H_4[SiW_{12}O_{40}] \cdot xH_2O$
 $H_3[PW_{12}O_{40}] \cdot xH_2O$
 $H_3[PMo_{12}O_{40}] \cdot xH_2O$
 $H_4[SiMo_{12}O_{40}] \cdot xH_2O$

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vanadotungstosilicic acid	$H_{4+n}[SiV_nW_{12-n}O_{40}] \cdot xH_2O$
vanadotungstophosphoric acid	$H_{3+n}[PV_nW_{12-n}O_{40}] \cdot xH_2O$
vanadomolybdophosphoric acid	$H_{3+n}[PV_nMo_{12-n}O_{40}] \cdot xH_2O$
vanadomolybdosilicic acid	$H_{4+n}[SiV_nMo_{12-n}O_{40}] \cdot xH_2O$
molybdotungstosilicic acid	$H_4[SiMo_nW_{12-n}O_{40}] \cdot xH_2O$
molybdotungstophosphoric acid	$H_3[PMo_nW_{12-n}O_{40}] \cdot xH_2O$

wherein n is an integer of 1 to 11 and x is an integer of 1 or more.

Claim 6. (original): A process as claimed in claim 1, wherein the heteropolyacid salt is selected from the group consisting of lithium, cesium, potassium, sodium, magnesium, barium, copper, gold, gallium and ammonia salts of at least one of the following heteropolyacids:

tungstosilicic acid	$H_4[SiW_{12}O_{40}] \cdot xH_2O$
tungstophosphoric acid	$H_3[PW_{12}O_{40}] \cdot xH_2O$
molybdophosphoric acid	$H_3[PMo_{12}O_{40}] \cdot xH_2O$
molybdosilicic acid	$H_4[SiMo_{12}O_{40}] \cdot xH_2O$
vanadotungstosilicic acid	$H_{4+n}[SiV_nW_{12-n}O_{40}] \cdot xH_2O$
vanadotungstophosphoric acid	$H_{3+n}[PV_nW_{12-n}O_{40}] \cdot xH_2O$
vanadomolybdophosphoric acid	$H_{3+n}[PV_nMo_{12-n}O_{40}] \cdot xH_2O$
vanadomolybdosilicic acid	$H_{4+n}[SiV_nMo_{12-n}O_{40}] \cdot xH_2O$
molybdotungstosilicic acid	$H_4[SiMo_nW_{12-n}O_{40}] \cdot xH_2O$
molybdotungstophosphoric acid	$H_3[PMo_nW_{12-n}O_{40}] \cdot xH_2O$

wherein n is an integer of 1 to 11 and x is an integer of 1 or more.

Claim 7. (canceled).

Claim 8. (currently amended): A process as claimed in claim ~~7~~1, wherein the concentration of water is from 1 to 10 mol% based on the total molar number of the lower aliphatic carboxylic acid and the lower alcohol.

Claim 9. (original): A process as claimed in claim 1, wherein the conversion of the lower alcohol is 70% by mass or more.

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Claim 10. (original): A process as claimed in claim 1, wherein the ratio of the lower alcohol to the lower aliphatic carboxylic acid is in the range of lower alcohol : lower aliphatic carboxylic acid = 1:10 to 1:1 in terms of the molar ratio of the sum totals of respective components.

Claim 11. (original): A process as claimed in claim 1, wherein the lower alcohol contains at least one of an olefin and a diether corresponding to the dehydrated products of the lower alcohol.

Claim 12. (original): A process as claimed in claim 1, wherein the lower alcohol is selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, sec-butanol, isobutanol, tert-butanol, allyl alcohol and crotyl alcohol.

Claim 13. (original): A process as claimed in claim 1, wherein the lower aliphatic carboxylic acid is selected from the group consisting of formic acid, acetic acid, propionic acid, acrylic acid, methacrylic acid and butyric acid.

Claim 14. (original): A process as claimed in claim 1, wherein the lower alcohol is ethanol and the lower aliphatic carboxylic acid is acetic acid.

Claim 15. (new): A process as claimed in claim 1, wherein the inorganic support is an inorganic support other than carbon.